

SALT LAKE CITY'S GREAT CONDUIT

Facts and Figures About the Big Cottonwood Waterway Recently Finished.

WHAT PLASTERING COST AND NECESSITY THEREFORE

Walls Had to Be Strengthened and the Roof Plans Changed.

Now the great conduit which is to bring the water from Big Cottonwood to Salt Lake has been completed, some facts about the waterway will prove immensely interesting. So eager was the Morris administration to spend the money derived from the sale of the special bond issue in order to aid that incompetent administration in its campaign, that the original plans and specifications were hastily prepared and were faulty in many particulars. When the American party came into power in January new plans were prepared, the line was changed and the conduit built so as to hold water, as the conduit tended. The American party, however, found the contract for the conduit awarded, and of course they were bound to it.

Plastering the Conduit.
The original plans and specifications of the Big Cottonwood conduit did not call for any plaster on the inside of the conduit, the concrete being left in its original condition, with square corners at the intersection of floor and wall. From a sanitary point of view it was necessary that these corners should be rounded in order to prevent the accumulation of deleterious matter at these points; both animal and vegetable substances having a tendency to collect in a square form of water passage. It was also self-evident that the roughness of the concrete on the inside of the conduit would be liable to retain any animal or vegetable matter which might find its way into the conduit, until it decayed and polluted the water. The reservoir into which the water passing through the conduit will eventually flow will be periodically cleaned, but the conduit itself may remain for years without being purified. It will therefore be readily seen how important it is to avoid any gathering of material in the conduit which might possibly tend to affect the purity of the water supply of the city.

To overcome these serious objections to the conduit, objections which would have existed had the original plans been carried out without being improved

upon by the present city administration, it was compulsory to cover the interior of the conduit with a cement plaster. The conduit, as originally designed, was objectionable for the further reason that in case the animal or vegetable matter passed over the irregular surface of the concrete, it would then have been carried to the reservoir. Under the present construction these will be carried along to mud drums and blow-offs, which have been placed at intervals on the conduit, specially for their discharge. These drums and blow-offs were not in the original design and consist of tanks ten feet deep, extending below the bottom of the conduit and properly fitted with valves for the emission of accumulated matter.

Necessary to Prevent Leakage.
Further, from a mechanical point of view, the cement plastering was considered necessary to prevent leakage. The concrete, as it stood in the conduit, was porous, and though at some future time it might possibly have become water tight, by the accumulation of silt, before this could take place there was great danger, especially in cases where the conduit is built on what is termed "made" ground, that the foundation would be undermined by the leakage, which would probably lead to the destruction of part, if not all, of the conduit. This danger is now entirely eliminated by the plastering of the conduit. That the danger was not imaginary was fully proved by the excessive leakage of the conduit when the water was turned into it from the Big Cottonwood creek, in order to ascertain if the conduit, with its concrete finish, was practicable. The City Councilmen went in a body to the conduit, at that time, and had ocular demonstration of the fact that the concrete was not water tight.

A still further reason for the conduit's being plastered with cement is the decreased friction of the water when flowing through the conduit over a smooth surface, thereby increasing the capacity of the conduit to a large extent.

It has been stated by some parties that cement plaster will not adhere to concrete after the concrete has become set. The fallacy of this statement can be shown both by the Parley's creek conduit and the city's gravity outlet sewer. To prove how tenaciously cement plaster will cling to concrete, when properly applied, it is only necessary to state that since the completion of the gravity outlet sewer, some ten years ago, at the beginning of each month heavy steel scrapers have been sent by the force of the sewage, from Fifth South street, or the beginning of the gravity sewer, through each section to the extreme end of the sewer, with the result that the cement plaster which was put on the concrete ten years ago, after the concrete had set, is still intact today and shows no signs of either abrasion or peeling off.

The estimated cost for the cement plastering of the conduit was 50,000 square yards at 35 cents per square yard, \$17,500. This price was additional to the figure stated on the original contract for grouting, the grouting not being used, as the cement plaster took its place.

Strengthening the Walls.
In the original plans the walls of the conduit were six inches thick. The roof was variable in thickness, from

four to six inches, according to the amount of estimated earth covering. The thickness of the walls, as originally planned, was insufficient to stand the side pressure, on account of the fact that one side of the excavation is much higher than the other, as the conduit is built on the side of a mountain, and also because the water would settle in the spaces left by the forms on the outside of the conduit, more particularly on the upper side. The forms referred to are the boards placed in position to be filled with concrete and removed when the concrete is completed. The water freezing in the spaces left by these forms would produce a pressure which was deemed dangerous for a six-inch wall, and the walls were consequently increased from a thickness of six inches to a thickness of eight inches to withstand this pressure and to prevent the possible destruction of the conduit. As now completed the walls will successfully resist the pressure. It should be borne in mind that it would be extremely unwise to take the same chances, from an engineering standpoint, in such an important matter as a conduit to supply water for a city the size of Salt Lake, as might be taken on a private dwelling. The conduit should be in existence for a considerable number of years and every care should be taken to avoid anything which has the remotest appearance of insecurity in the future.

The roof of the conduit was changed from a flat surface, as designed in the original plans, to the form of an arch, in order to support the vertical pressure, both from the back-filling and the weight of the mountains.

The extra concrete necessary for these changes made in the original dimensions of the conduit was estimated at 3162 cubic yards, at the original contract price of \$10.75 per cubic yard, \$33,991.50.

Back-filling Exposures.
A large portion of the conduit is built either on the surface of the ground or on piers across ravines, some of these exposures being several hundred feet in length. The original specifications did not call for the covering of these. The rate of expansion of concrete under different degrees of temperature is about one-twelfth of an inch per 100 feet for every 10 degrees. The extreme variation of temperature along the line of the conduit on the surface of the earth, where exposed to the direct rays of the sun, is not less than 150 degrees Fahrenheit, which would produce a tension on the conduit sufficient to rupture the walls. The conduit having been constructed in a very exposed locality, there was also a danger that water flowing at the estimated velocity through the exposed portion of the conduit might freeze and consequently cause the stoppage and even the possible destruction of the conduit. Further, the surface of the concrete, being rough and porous, would naturally accumulate sufficient moisture during the cold weather to be in danger of disintegration through the action of the frost. This rendered it necessary that the entire length of the conduit should be covered with earth of sufficient depth to prevent freezing at the surface of the conduit. This earth covering, in addition to protecting the conduit against the action of the elements, will maintain the water flowing through it

at a much lower temperature during the summer months than it could possibly have been if the exposed portions of the conduit had been left uncovered. The additional back-filling necessary to cover all the exposed portion of the conduit was estimated at 80,020 cubic yards, at 30 cents per cubic yard, \$24,186. This makes a total for these three absolutely indispensable alterations of the original plans and specifications of the Big Cottonwood conduit of \$75,677.50.

Further Changes Made.
A further change which was made in the original contract, differing considerably from the original specifications, was made for protecting this material in the construction of the roof of the conduit tunnels. Under the original contract hard, common, pressed brick was specified as the material to be used in the arches through tunnels. No provision was made for protecting this material on the inside from the action of vapor which would arise from the water in the conduit, and the total destruction of the roof was only a matter of time by the action of this vapor softening and crumbling the brick. The few tunnels that had been arched with brick, prior to the present city administration, it was found necessary to plaster with cement mortar; in all the remaining tunnels the roof was constructed of concrete, which will not be injuriously affected by the moisture of the vapor.

Highest prices paid for cast iron, copper and brass. Hysum & Silver Foundry and Machine Co., 454 W. 5th North.

PRETTY GIRL A THIEF

Comely California Maiden Admits Robbery of United States Mails.
LOS ANGELES, Cal., Sept. 15.—Maria Vidal, a comely, half Mexican girl, is in the city jail charged with grand larceny. She admits the theft, and confesses she made a dupe of her friend, Lucy Hernandez, to aid her in obtaining a letter addressed to Blas Figueroa which contained a \$5 bill. Maria Vidal is an old offender, but her latest crime is the first to be surrounded by evidence as to warrant her retention by the police. Several weeks ago, Maria, who lives at 412 1/2 North Main street, learned that the letter addressed to Blas Figueroa awaited his call at the Rand hotel. She summoned a waitress, Lucy Hernandez, schoolmate and consort, to whom she confided the letter awaiting a friend of hers who had instructed her to receive his mail until his return to the city. Miss Vidal feigned illness and requested Miss Hernandez to call at the hotel for the letter. The friend did so, obtained the letter and delivered it to Miss Vidal, who opened it and devoted to her own use the \$5 bill inclosed. Figueroa reported his loss to Detective Talamantes and within half an hour the officers placed Miss Vidal in custody. At first the young woman stoutly denied the theft, but after close questioning admitted it. She likewise admitted similar thefts, with which the police accused her several months ago.

FARMERS ARE GETTING WORST OF THE DEAL

How the Sugar Company Is Robbing the Growers of Beets.

That household commodity, sugar, dealt in so largely by the hierarchy of this State and the Outter stock and investment agency, an adjunct of that exploiting organization, has been steadily advancing in price, and Saturday it was quoted on the market at \$5.60 per hundred. Gov. Cutler, in his attack on the mining interests of this State, the industry which really supports the population of Utah, omitted to give any information of the exploitation of the people by the operators of the sugar trust, doubtless because he and his immediate family and the members of the hierarchical syndicate are directly interested in that shameful exploitation. "About ten years ago," said a gentleman to a Tribune representative Saturday, "the men directing the sugar industry of this State paid the farmers \$5.25 for their beets. Then sugar sold around \$5 per hundred. Now they are paying the beet raiser \$4.75 a ton and last year sugar reached \$6.50, and right today it is making rapid strides toward the \$8 mark, and may again touch \$9.50, for the season is just opening and it has an abundance of time to advance on the market."

"And yet," continued this gentleman, "these same men will ship their surplus product to the Chicago market, paying thereon a freight rate of 63 cents, and sell it there for about \$4.50 per hundred! What would you call that? Is it or is it not an exploitation of the consumers of that product in this State?" And the organ of the hierarchy is almost daily dishing out to the beet farmer special dope for his benefit, telling him what an honest, industrious toiler he is, how he is developing the country and waxing wealthy on the money paid him for beets; when in reality he is not receiving an honest and rightful percentage for his daily toil, but is working so that he may enrich those who toil not. "Consider the Miles of the field; how they grow; they toil not, neither do they spin, and yet I say unto you that even Solomon in all his glory was not arrayed like one of these." Let the apostolic editor and the hierarchy give heed and ponder this text, so that they may set themselves right with the faithful at the coming conference.

Mister, can you tell me where Dr. C. W. Higgins's office is? Why, yes. Didn't you know he had moved? He is at No. 28 West Third South.

EXCURSION TO OGDEN

Sunday, September 16th, Via O. S. L. Round trip \$1.00. Take any train up to 6:05 p. m. Returning, special will leave Ogden at 10:30 p. m. The Masons will dedicate their new hall on this date.

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